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THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

No. CCLXXXIV.

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Life-History of Agrotis Segetum (the Turnip Grub).

By Edward Newman.

I believe I should rather understate the fact if I were to say that I had received, through her Majesty's Post-office, one hundred consignments of this most injurious insect, together with details of its ravages and demands for a remedy. It is taken for granted, from my long course of observation, and frequent communications to public papers on the subject of insect pests, that I possess a sort of omniscience in these matters, whereas, the truth is, however we may seek to disguise it, that the most learned and most observant of entomologists knows but little, very, very little; and when he ventures on advice, that advice, instead of being couched in the cabalistic figures of a prescription, or a recommendation to purchase some nostrum of which he, the entomologist, may be supposed the proprietor, is generally a simple recommendation to the querist to allow Nature to take her course. Thus, all my own observations tend to show that Nature is her own physician, and that neither allopaths nor homœopaths can do anything better or wiser than allow Nature to work out her own cure. In our own bodies we find that almost every disease can be traced, more or less directly, to some interference with the course of Nature: we eat too much, or drink too much, or interfere in some way with Nature's laws; inconvenience follows, and we demand a counter interference to balance the first. It is exactly thus with the world of animals. Birds, insects, all living things, have their appointed food: this is a law with which it is dangerous to interfere: the present instance is as good an illustration of this as can possibly be given. Nature supplies roots as the food for the turnip grub. Man increases the supply of food prodigiously; Nature increases the number of devourers prodigiously. The farmer does everything in his power, and very properly so, to increase the crop of swedes, turnips, mangold wurzel, potatoes, and so forth; Nature does all in her power to increase the number of the grubs so abundantly supplied with food: these grubs are the especial and favourite food of certain birds—the partridge, the rook, the starling. Following up the invariable law, Nature multiplies the birds because of this superabundant supply of grubs; man thwarts Nature, destroys the birds, and gives immunity to the grubs. Thus we allow the grubs to increase—in fact, give them every encouragement; they revel in the abundance we have provided for them, and we wonder at their voracity, and demand a remedy for the injury we have caused. This principle of interference is carried on

BRITISH MUSEUM

by man in very many other instances, in a manner highly detrimental to his own interest: he pays the price of a sack of grain for every owl nailed to his barn-door, because that owl would destroy mice every night; and these mice being relieved of their oppressive enemy would, in a very short time, destroy a sack of wheat, peas or beans. The kestrel, in like manner, kills mice, and the death of a kestrel may fairly be reckoned a loss of five pounds. A sparrowhawk left to himself, even by scaring the sparrows from the ripening grain, will save the wages of at least three boys. In Scotland the incessant warfare against birds of prey, and the near accomplishment of their extermination, has allowed such an increase of the ring dove as to threaten, by their insatiable voracity, a dearth of cereals for the food of man. Associations are formed, officers appointed, speeches made, rewards offered: the object being solely and exclusively to remedy the evil which the speech-makers have, by their supposed sagacity, induced. Fifty such instances might be given, but let us take the particular instance of the turnip grub. Two birds make it their special and favourite food; these are the partridge and the rook. Neither of these is favoured with a place in that "gamekeeper's museum," the bole of an oak or the door of a barn; but, nevertheless, they are persecuted for sport, or destroyed by poison, and, whatever the pretext for the slaughter, the effect is the same. Partridges and rooks alike grace our tables—partridges under their own name, rooks, *nomine mutato*, as the chief ingredient of pigeon pies.

The history of the turnip grub has only been partially narrated. I will endeavour to give it briefly, but in a somewhat more connected form. The first author who noticed the extent of its ravages was "Rusticus" of Godalming, in 1832; the second, Mr. Le Keux, in the 'Transactions of the Entomological Society,' in 1840; and the third, Mr. Curtis, in his 'Farm Insects,' in 1860. Neither of these authors has observed the commencement of the evil. The grub is the offspring of a moth, Agrotis Segetum, which is seen on the wing twice in the year—first, in June; and, secondly, in October. Of course, naturalists assume that the October flight is the produce of the June flight, and the June flight the descendants of the autumnal flight; this is not so; there is but one generation in the year.

The egg is laid in June, on the ground, and soon attacks the young plants of the various kinds of turnips, carrots, cabbage-plants, charlock, mangold wurzel, radish, and a number of the common weeds. Having tried the grub with a great variety of provender, I can vouch for its feeding on any plant sufficiently succulent; but when young its depredations are mostly above the surface of the ground, and it seems to delight in that particular part of a plant which lies between root and stem, as I have found numbers of young turnips and carrots divided exactly at this spot, the upper part being left to perish on the surface of the ground. In August and September the grub goes further down; its operations are now almost entirely subterranean, and its chosen site is the very base of the turnip bulb around the tap root which descends into the earth. Here it excavates large and almost spherical cavities, in which it resides henceforward, except during severe frost, not returning to the surface unless its food fails. When full grown it is an inch and three-quarters, or even two inches, in length, extremely stout, and its skin tight and shining. When forcibly unearthed, it rolls itself in a loose ring, but almost immediately afterwards unrolls, and, if placed on the surface of the earth, instantly buries itself with the activity and skill of a mole. Both rooks and partridges are aware of this, and it is very interesting to watch with a pocket-glass the instantaneous movement with which they seize on this grub directly they have brought him to the surface, the rook delving for him with his beak,—a habit that might have obtained for this invaluable bird the name of *fodiens* rather than *frugilegus*,—and the partridge turning him out by the simple expedient of scratching, after the method practised by all birds of the poultry order.

The head of the full-fed larva is stretched out on a plane with the body, and is much narrower than the 2nd segment, flattened, and not notched on the crown; the body is cylindrical, the back slightly wrinkled transversely; the colour of the head is pale dingy brown, with two longitudinal patches of dark brown on the face; the labrum and antennal papillæ are white; the body is pale smoke-colour, sometimes slightly tinged with pink, and the 2nd segment having on its back a dark and semicircular shining plate; each of the other segments has ten circular, shining, dot-like spots, slightly raised above the surface of the skin, and slightly darker than the ground colour; each of these spots emits a small central bristle, and each, also, is surrounded by a paler area; on the 3rd and 4th segments these spots form a pretty regular transverse series, but on the 5th and following segments four of them are ranged in a square or trapezoid; one spot is situated just above each spiracle, and one below it, and two others on each side of each spiracle; the spiracles themselves are very small and intensely black; the belly of the larva is the colour of putty; the legs are pale, and the claspers putty-coloured and very small, not spreading at the ends. The larvæ turn to smooth brown pupæ in the ground, some in

October, but the greater number not until the following May. Those which become pupæ in October emerge as perfect moths in the course of a few days; they rarely, if ever, pass the winter in the pupa state, and it is a very remarkable and hitherto unexplained fact, but one which I have dwelt on at some length in a paper read before the Entomological Society, that the female moths which are disclosed in October and do not hybernate are almost invariably barren: I say *almost*, because I do not desire to press this theory unduly; as far as my observations have extended they are *always* barren females, and therefore entirely useless as regards the continuance of their kind. This is by no means an isolated case of the superabundant supply of life provided by Nature; the autumnal production of drones in bee-hives, not one in a thousand of which ever serves any useful purpose, as far as apiarians have ascertained, is a similar instance of the lavish abundance Nature supplies, and the destruction of these drones by the workers is a striking instance of the mode in which she disposes of this superabundance. These barren moths are not merely of necessity unproductive from the absence of males, but their bodies are perfectly empty, mere hollow cavities without eggs or any perceptible ovary.

If the winter prove severe the larvæ retire entirely beyond the reach of frost, returning towards the surface again as soon as the thermometer rises.

The bulk of the brood emerges in June, and then the sexes are in equal numbers, and the females are invariably fertile, their bodies being filled with eggs. A vast and incalculable amount of injury accrues from this hybernation of the caterpillar. The hybernation of caterpillars is a very familiar fact to entomologists; but they live through the winter in a quiescent state, as though slumbering, and do not eat, simply because their usual supply of food has failed; the leaves have fallen, and they are compelled to wait until spring has produced a fresh supply. But in the case of these turnip grubs it is very different: their food, being roots, is to be found at all seasons, and the work of destruction goes on incessantly, and is only limited by the supply; indeed the various agricultural roots are often harvested with the enemy concealed in the interior.

There is small need for me to dwell on the injurious character of this insect; every farmer and every gardener must have been convinced of this during the dry summer and autumn of 1864. The great cause of the evil may be traced to the use of poisoned wheat, provided intentionally for the rooks, and perhaps unintentionally, but certainly to an equal extent, for the partridges: this has been carried so far that the legislature has at last stepped in to protect the farmer from himself, to compel him to stay his suicidal hand. Well aware am I that a disposition has arisen among that better and more educated class of farmers into whose homesteads the 'Zoologist' is penetrating, to regard this subject in a more logical and more scientific point of view.

EDWARD NEWMAN.

Life-Histories of Sawflies. Translated from the Dutch of M. Snellen van Vollenhoven, by J. W. MAY, Esq.

(Continued from page 9477).

NEMATUS WTTEWAALLI (*v. Voll.*)

Larva and imago undescribed.

Nematus rufo-flavus, antennis, vertice, fronte, et tarsis posticis fuscis, alarum stigmate pallide fusco, dorso metathoracis et mesothoracis, macula basali abdominis ac maculis pectoralibus nigris.

I cannot find that this wasp has been described by any author who has treated of European sawflies; as far as the larva is concerned this may very well have been confounded with nearly allied species; for in the absence of any but superficial descriptions of such very similar larvæ it is extremely difficult, not to say impossible, to determine which of the allied species the writer has really had in view.

I received the larva from Dr. Wttewaall, who sent it me from Voorst and Utrecht, also from Mr. de Roo van Westmaas from Velp; I also took it myself near Leyden and at Sterkenburg near Driebergen, in the year 1861, when a considerable number of willows near ter Wadding, between Leyden and Voorschoten, were entirely unleafed by this insect.

It lives gregariously until spinning up, almost always attaching itself by the eight or ten anterior pairs of legs and raising the body frequently in the air. How and where the eggs are deposited I do not know. The young larvæ differ very little from the older, being only somewhat darker in colour.

The larvæ live on different species of willow; de Roo found them on Salix capræa, Wttewaall on Salix alba, and I myself took them on

Salix babylonica and S. pentandra. They are eminently voracious, and seem as if they did their best to get through their larval stage of existence as quickly as possible, for they feed without intermission. Those sent to me from Voorst were received on the 5th of May, those from Velp on the 6th of July; I also found them at Sterkenburg at the end of July, and near ter Wadding in August and September. We always found half-grown and full-grown individuals on the same tree. From the above it will be seen that it is very difficult to determine how many generations there may be in the course of a year; four may be looked upon as certain,—there are probably five.

The following will serve as a description of these larvæ.

Head shining, black, fuscous between the eyes and at the base of the trophi. Legs twenty. Body slender; the first segment orange without black spots; the second to the tenth segments pale sap-green, with three black lines on the back, the edges of which lines are not even, nor emarginate, but as it were frayed out. Below the plane of the white tracheal tube, which can be perceived through the skin, are some oval and circular shining little black knobs, namely, on the second and third segments three spots united so as to form a line; on the other segments first an oval spot, then two smaller nearly circular, and below this first row a second, consisting of a small vertical elliptic spot and a larger horizontal one, elliptic, and evidently consisting of two joined together. The last two segments are orange and unspotted, the thirteenth in young individuals being green at the base. The anal valve is orange, with two little orange spines; the ventral surface yellowish green and unspotted. There are some little hairs about the legs and at the anus.

The first pair of legs is orange at the base, glassy green further on; the two following pairs greenish, with a small black spot at the base. these horny thoracic legs have a thick pad on the penultimate joint, the last joint being armed with a black claw. The middle legs are green, unspotted; the anal legs orange.

The larvæ did not all attain the same size; some when full grown were only fifteen millimetres long, others eighteen millimetres. When they were about to change they descended to the ground and crept about among the dried leaves, and shortly after constructed simple cocoons of a yellow colour, which were placed close together and connected by a loose web. Comparing these cocoons with those of the preceding species, a great difference will be apparent, so as to render remarkable the close agreement between the imagos.

In the summer the larvæ change into pupæ within ten or twelve days; those of the autumn brood probably only reach this stage by the spring, thus after an interval of seven months. The pupa represented at fig. 6, enlarged 2½ linear, is very pale yellowish green, with dark eyes, a little green coloration being observable on the prothorax, the margins of the abdominal rings and the last segment; the black and brown mass attached to this latter in the figure is the old larval skin. This pupa remained in that state for a very short time; a couple of days after the imago appeared. This was seven millimetres long, expanding to sixteen millimetres, thus being somewhat smaller than Nematus Salicis; it has otherwise so much resemblance to that species that it requires careful examination to separate the two. It will not be necessary to describe the imago in detail; but it will be, I think, sufficient if I state the points of difference between N. Wttewaalli and N. Salicis.

Nematus Wttewaalli is, as has been said, generally smaller, its largest examples resembling the smallest of N. Salicis. The antennæ of N. Wttewaalli are more fuscous, the head is darker, especially on the vertex. The wings have a redder, less yellow, tint; the stigma is brown, instead of black. The colour of both thorax and abdomen is a darker orange and not so much of a gamboge-yellow. The cenchri are entirely surrounded by black colouring, which colouring, moreover, extends to the second abdominal segment (fig. 7). Lastly, on the prothorax, near the coxæ of the first pair of legs, is a small black spot (fig. 8 *a*), and the mesothorax or breast, between the first and second pair of legs, was entirely black (fig. 8 *b*). In fact, the points of difference are greater than a cursory examination would have led one to suppose.

I obtained from this species four examples of Tryphon exstirpatorius, *Grav.*

I am acquainted with another species of Nematus, which, in the larva state, has a very strong resemblance to N. Wttewaalli, but is of a grayish green colour, and lives on poplars. The imago has a black stripe over the abdomen. For want of a good specimen for drawing, and from which to write the description of the imago, I am unable to insert it here in order to complete the group.

NEMATUS TRIMACULATUS.

For the larva, see De Geer, 'Mémoires,' Vol. ii. p. 264, No. 17, plate 38, fig. 1.

Nematus fulvus, antennis supra fuscis, maculis tribus in thoracis dorso nigris, abdomine immaculato.

In the larval state this insect pretty strongly resembles Nematus Salicis (see plate 3), and in the perfect state Nematus fulvus, *Hart.* It appears to me that the imago has never been described, but the larva is described by De Geer, *loc. cit.*; his description is also referred to by Brischke, in his account of Nematus Salicis, where he speaks of a very nearly allied species which has probably been confounded with the one under consideration.

I have only once had an opportunity of examining these larvæ, and that was in September, 1859, at which time I found a number upon a poplar in my garden in the position in which I have represented one at fig. 9. They are very easily distinguished from N. Salicis by this position in which they rest, as also by the colour of the body and the distribution of the black spots. They have twenty legs, as have all the larvæ of Nematus with which I am acquainted. Head entirely shining, black, the first three and last three segments of the body are orange, the intermediate part bluish gray. The ventral surface and the first five pairs of abdominal legs are somewhat greener than the back, which is blue-gray; the stigmata are very small and obscure, the last pair of abdominal legs and the anal legs are orange. On the first three segments are a very few black dots, the largest being above the legs of the second pair. Along each side of that part of the back coloured blue-gray are three rows of shining black spots; these do not run together, and are most of them almost square; there are, moreover, two small elliptical spots just above each leg. Thus, besides the tint and the relative extent of the colours, the number of rows formed by these black spots affords a very good and ready characteristic to separate this larva from that of N. Salicis, N. trimaculatus having six and N. Salicis seven such rows. The last divisions, again, are but little spotted, the penultimate segment only having at the end two clearly defined transverse rows of round spots; above the anal valve is a shining black spot, below which are two little *black* spines (fig. 11). These larvæ were also very voracious and were almost continually feeding, sparing only the lower parts of the leaf-veins. Shortly after I had found them they went into the ground, but not to any great depth, and made their cocoons; these were double, having coarse meshes on the outside and were covered with grains of sand, the inside being polished, smooth, fine and of a dark brown colour. Fig. 12 represents the inner cocoon, which has been opened by the wasp, lying inside the outer cocoon, this latter being torn open on one side.

I was more fortunate with my brood than De Geer was with his;

on the 11th of May, 1860, out of six cocoons I got six females of the species of Nematus in question. My remaining larvæ appear to have dried up and died in the cocoons. I was sorry not to have got a male, but I did not consider this a sufficient reason for postponing the publication of this description, as I thought it best to publish these three so nearly allied species together.

At first sight I took these insects for Nematus fulvus, *Hartig*, but a close examination showed it to be a new species, and I felt the more sure on this head from the fact of all my examples being perfectly alike.

The imago is eight millimetres long, expanding to eighteen. Entirely shining reddish yellow, the upper surface of the antennæ being fuscous; the points of the upper jaws shining chestnut-brown; there is a little dark spot between the three ocelli, and three oblong black spots on the dorsum of the thorax. The anterior wings have a yellow tinge. The costal and postcostal nervures, the stigma, and the anal nervure are orange, the remaining nervures black.

The points of difference between the present species and Nematus fulvus of Hartig are as follows: the upper surface of the antennæ is not so dark in N. trimaculatus as in N. fulvus; the posterior margin of the scutellum is red, not black; there is no black line on the middle of the dorsum of the abdomen, and there is no trace of brown on the posterior tibiæ and tarsi.

I have not met with any of these larvæ during 1860 and 1861; should I, however, do so, and be so fortunate as to rear a male, I shall be happy to insert a description in this periodical, and give it as an appendix to some nearly allied species of Nematus.

Note on the Turnip Grub.—Last autumn, having a large field of Swedish turnips near to where I reside, I had an opportunity of making a few notes on the economy of Agrotis Segetum, or whatever it is that attacked the turnip-roots. In August and September, noticing large flocks of rooks and starlings hovering over and alighting on the field, I was induced to examine some of the turnips, and I found that the earth had been billed away by the birds to get to the insects. A little later I walked over the field, which comprises fourteen acres, and I could scarcely find a single turnip that was not eaten. The earliest sown turnips seemed to suffer most. Many of the larvæ retired into the earth with the first frosts, but a vast number did not enter the chrysalis state. I found them in the soil in winter in all stages of growth. When the field was ploughed, in March, the rooks and starlings were again busy; the latter, however, were not so numerous. The starlings were very tame; they would alight sufficiently near the ploughmen to permit a view of their burnished plumage. Besides the rook and starling, the thrush, the common hen and the Guinea fowl will eat these larvæ greedily. Great havoc was committed among potatoes. I found them numerous among gooseberry rows and in waste places.—*George Roberts; Lofthouse, Wakefield.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

April 3, 1865.—F. P. PASCOE, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'The Journal of the Royal Agricultural Society of England,' 2nd series, Vol. i.; presented by the Society. 'The Transactions of the Linnean Society of London,' Vol. xxiv, Part 3; by the Society. 'The Journal of Entomology,' No. 12; by the Proprietors. Hewitson's 'Exotic Butterflies,' Part 54; by W. W. Saunders, Esq. Doleschall, C. L., 'Bijdrage tot de Kennis der Dipterologische Fauna van Nederlandsch Indië,' Parts 1—3; 'Bijdrage tot de Kennis der Arachniden van den Indischen Archipel;' 'Tweede Bijdrage tot de Kennis der Arachniden van den Indischen Archipel;' by A. R. Wallace, Esq. 'The Entomologist's Monthly Magazine' for April; by the Editors. 'The Zoologist' for April; by the Editor.

Election of Members.

Captain Willoughby S. Rooke, of the Scots Fusilier Guards, and of Bigswear, Gloucestershire; R. S. Scholfield, Esq., of the Junior Carlton Club; and Dr. Sichel, of Paris, were severally ballotted for, and elected Members. Mr. Stephen Barton, of Bristol, was ballotted for, and elected an Annual Subscriber.

Exhibitions, &c.

The President exhibited a new species of Bolboceras from South Australia, which was found burrowing in the hard road at Gawler, near Adelaide, a habit similar to that of the European B. gallicus. The Australian species was described by its captor, Mr. Odewahn, as "making a noise like a Longicorn, by moving the small pulvilli beneath the hind coxæ."

The President read the following extract from the 'Athenæum' of the 18th of March, 1865:—

"Bottesford Manor, Brigg, March 13, 1865.

"In Saturday's 'Athenæum' (p. 352), it is recorded, that at the Meeting of the Entomological Society, held on March 6, 'Mr. Bond exhibited specimens of a gall found on a willow tree near Cambridge; the attack of the insect . . . caused a premature terminal development of leaves in whorls, so as to resemble a flower-head.' Galls of this kind are of very frequent occurrence on willows in this neighbourhood, and, I believe, throughout the whole of Lincolnshire. They are so common here that I have always supposed that they must be familiarly known to naturalists. They first show themselves in the latter summer and early autumn, but are not easily discovered until the tree sheds its leaves. When that happens the gall-leaves become prominent objects. Their form is singularly like that of a small rose, and the likeness is increased by the colour, which, in December and January, is a light brown, very often nearly approaching red. As time goes on the brown becomes deeper, and when the green leaves shoot forth in spring the galls drop off. The likeness to a rose is often so complete that an uninstructed person might easily be led to the absurd conclusion that he had seen roses growing on willows. That this opinion was current at one time is proved by the following entry in the chronicle of John Capgrave, 1338: 'In that same yere welowes bore roses, red and frech; and that was in Januarie,' p. 207. This is another proof to be added to those accumulating daily, that the strange histories to be found in the records of past ages are not, for the most part, deliberate fables, but truths ill understood, or facts seen out of their proper perspective. There is a story told by an Irish writer, of a certain willow tree, which, having received the blessing of S. Coënginus, straightway began to bear apples. (*Lau. Beyerlinck, Theat. Vitæ Humanæ*, t. 1, p. 921a), It is highly probable that the foundation of this legend must be sought in a similar direction.

"Yours, &c.,

"EDWARD PEACOCK."

Mr. W. W. Saunders exhibited a number of galls collected during the previous year in Southern Syria by Mr. B. T. Lowne. One was on a species of Acacia, from Engedi; another was of scaly or flaky material placed round the stems of Atriplex Italinus, from the Dead Sea; a third, probably the gall of a Dipterous insect, was on a grass; a fourth kind occurred on Reaumuria, from Ain Terebeh, Dead Sea; a fifth on Ærua Javanica, from Engedi; a sixth on a Salvia, from the same locality; and a seventh kind was found on a species of Tamarix, at Ain Terebeh. With respect to the first two, Mr. Saunders was unable to say with certainty whether they were the nidi of insects; the gall on the tamarisk bore great resemblance to that described and figured in the 'Transactions' some years ago (see Trans. Ent. Soc. v. 27, pl. ii. figs. 5—9), and was probably caused by one of the Buprestidæ. Mr. Saunders hoped to breed some of the perfect insects, and on a future occasion to supply further information, or at all events to lay before the Society accurate drawings of the galls.

Mr. F. Moore exhibited a small collection of Lepidoptera lately received, *by post*, from Captain A. M. Lang, from the North-Western Himalaya. It included various Polyommati; a fine new Chrysophanus from Kunawur; a small Anthocharis, allied to A. Cardamines, also from Kunawur; two undescribed species of Pieris—one allied to P. Mesentina—from the Runang Pass (14,800 feet elevation); a specimen of Pieris Daplidice, which was found in considerable numbers in the village fields along the Spiti River; Gonepteryx Wallichii from the north of Simla; Parnassius Jacquemontii and P. Hardwickii—the former from the high passes (18,000 feet) in Upper Kunawur, Spiti and Tibet, the latter from the Runang Pass (14,800 feet). Of Nymphalidæ there were Argynnis Kamala and A. Jainadeva from the Simla district and Kunawur; a new Limenitis, allied to L. Sybilla, from North of Simla; a beautiful little Melitæa from the Kongma Pass leading from Kunawur into Chinese Tibet. Of Satyridæ, five new species of Lasiommatus, Hipparchia and Erebia, from the mountain slopes of Spiti, Upper Kunawur, and Tibet. Lastly, a single specimen of the curious form figured by Bremer, in 'Lepidopteren öst Sibiriens,' as Callidula Felderi.

Mr. F. Moore also exhibited two Entomogenous Fungi found at Darjeeling by Mr. A. E. Russell—similar to that figured in plate 277 of vol. iii. of Cramer's Pap. Exot., upon a species of Sphinx (Pachylia achemenides) from Surinam. One of these parasitic Fungi was upon a male imago of the common Indian Lepidopterous insect, Spiramia retorta (Noctuidæ, Fam. Hypopyridæ), and the other upon the imago of a species of an undetermined Geometridous genus. Both these moths had the fungus springing, in more or less lengthened hair-like filaments, from the body, legs, palpi, antennæ, and along the nervures (but not from the membranous portion) of the wings on the upper side. Mr. Moore was informed by Mr. M. C. Cooke that these peculiar Fungi belong to the doubtful genus Isaria, the majority of the species of which are parasitic on insects or exuviæ: this genus is *not* regarded as autonomous, but as a condition of the ascigerous genus Cordiceps (Entomogenous Sphæriæ).

Mr. Janson exhibited a large collection of insects, principally Lepidoptera and Coleoptera, formed by Mr. A. E. Russell in Bengal and the Himalayas.

The President read the following extract from 'The Times' of the 28th of March, 1865:—

"*French Honey.*—A great portion of the immense quantity of honey consumed in France is supplied from the island of Corsica and from Brittany. Corsica produced so much wax in ancient times that the Romans imposed on it an annual tribute of 100,000 lbs. weight. Subsequently the inhabitants revolted, and they were punished by the tribute being raised to 200,000 lbs. weight annually, which they were able to supply. Wax is to honey in Corsica as one to 15, so that the inhabitants must have gathered 3,000,000 kilogrammes* of honey. When Corsica became a dependency of the Papal Court it paid its taxes in wax, and the quantity was sufficient to supply the consumption not only of the churches in the city of Rome, but those in the Papal States. Brittany likewise supplies a great quantity of honey, but of inferior quality to that of Corsica. The annual value of the honey and wax produced in that province is estimated at 5,000,000f."

The President read the following note:—

"Last July, when passing over the snow-fields on the top of Monte Moro, at an elevation of about 8000 feet, I noticed here and there a sharply-defined cylindrical hole in the snow, such as might have been caused by pressing a wine-cork into it. These holes were generally about an inch in depth, and at the bottom of each was either a small lump that looked like peat, or more frequently an insect, invariably either Dipterous or Ichneumonideous. I cannot account for the lumps of peat; but I imagine that the insects settling on the snow, became torpid from its low temperature, and sank gradually (or perhaps rapidly) into it, the hole being caused by the melting of the snow by the radiation of heat from the insect. The solar rays on mountain summits are asserted to be warmer than those falling on the plains, but there is no doubt that the radiation from solid bodies at great elevations is very marked. I took Cryptus tarsoleucus apparently not long alighted, and still feebly moving a wing or a leg. Perhaps it is only in the finest weather that insects would take so lofty a flight; however, a little lower down, Bombus montanus was not uncommon, enjoying itself amongst the flowers of a Linaria, but surrounded on all sides by patches of snow. Nearly up to the same point I frequently passed a little black moth, Psodos trepidaria, taking its short trembling flight. Higher than either of these, and among some short grass in the middle of the snow, I found a Byrrhus. These were the last evidences of animal life observed. But as flowering plants extend to upwards of 10,000 or even 11,000 feet, it would be interesting to learn if insect-life in any form co-exists with them. A mammal, Arvicola nivalis, is found, I believe, at the highest point of phanerogamic vegetation."

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* *Qu.* kilogrammes or pounds?

In reply to enquiries, the President added that the insects in the snow were all dark in colour, that the holes were on the slope of the mountain on which the sun was shining directly, and that they were truly cylindrical, not hemispherical, or narrowed at the bottom. His explanation of the phenomenon did not meet with general acceptance; it was objected that radiation was scarcely likely to produce a cylindrical excavation; and Mr. A. R. Wallace doubted whether an insect of so small bulk and mass, and which could only give off by radiation the heat which it had first absorbed, was capable, even though of dark colour, of absorbing sufficient to produce the considerable melting of the snow around it which the President had described.

Prof. Westwood directed attention to Karsten's recently-published 'Beitrag zur Kenntniss des Rhynchoprion penetrans,' and protested against the generic appellation there applied to the Chigoe or Jigger. Linnæus was uncertain to what genus to refer the insect, and Latreille suggested that a new genus was probably required for its reception; the Rev. Lansdown Guilding had in MS. assigned to it the name Sarcophaga, which, however, had been previously employed amongst the Diptera. In a paper in the 'Transactions' of this Society (vol. ii. p. 199), Prof. Westwood had himself first given the generic characters and published the name Sarcopsylla; Dugés had about the same written on the Jigger, but referred it to the genus Pulex, and Guérin-Méneville, in the interval between the reading (May 1, 1837) and the publication (1840) of his (Prof. W.'s) paper, had on the plates of the 'Iconographie du Règne Animal' employed the name Dermatophilus, but his description was not published till long afterwards. The name Sarcopsylla was entitled to stand, according to the rule of priority, and Prof. Karsten was not justified in rejecting it, and falling back upon Rhynchoprion, which had been formerly used for a genus of Acari. Prof. Westwood also took credit to himself for having first shown that the Jigger was oviparous, not larviparous or pupiparous; Prof. Karsten had now shown how the sexes might be distinguished before the female became gravid: the 'Beitrag' also contained elaborate details of the structure and anatomy of the Jigger, but it did not contain one word on the generic arrangement, nor did it add one single fact to the natural history of the species. He (Prof. W.) was anxious to know what became of the eggs after they were deposited (say) in the toe of a human being? where did they hatch? and where and upon what did the larvæ feed? There could not be room for all the numerous eggs to develope in such a situation as above supposed; and moreover, in the vast majority of instances the eggs could not be deposited in flesh at all.

Mr. Bates had had personal experience of the attacks of the Jigger, but was unable to answer the Professor's enquiries; the common belief was that the body of the female burst within the toe, that the eggs hatched therein, and that the larvæ fed upon the flesh; but he had never had anything but eggs (no larvæ or pupæ) extracted from his own person; if during the process of extraction the body of the female burst, he had always applied tobacco-juice to prevent any ill effect.

Paper read.

Mr. Bates read a paper "On the Species of Agra of the Amazons Region."

In the introduction, the author treats of the affinities and describes the habits of this arboreal genus of Carabidæ peculiar to Tropical America, and then proceeds to characterize sixteen new Amazonian species, whereby the total number of described species is advanced to 140. Forty-seven species of Agra and Agridia are recorded as occurring in the Amazons region; of these forty-two were found by Mr. Bates, and thirty-one of them were new to Science.

The employment by Mr. Bates of the two forms Carabici and Carabidæ to denote the same group of insects evoked from the President a strong protest against the indiscriminate application of two names to the same thing; he insisted also upon the desirability—to prevent confusion, amounting to a necessity—of having one uniform termination for the names of groups of co-ordinate value and importance; and further, that the proper termination for the name of a family was *-idæ*, the form almost invariably adopted by English entomologists, and which was now being adopted also by the French. Prof. Westwood also expressed himself in favour of the nomenclature introduced by Kirby, and the employment of *-idæ* as the termination of the name of a family or of a group of insects corresponding to one of the old Linnean genera.

New Part of the 'Transactions.'

A new Part of the 'Transactions' (Third Series, Vol. ii. Part 4) was on the table. —*J. W. D.*

Note on the Wolf Fish.—This fish very rarely comes amongst us: I was, therefore, glad to secure a half-grown specimen at a fish-stall; it measured 3 feet 2 inches. To my great disgust, barbarous hands had been laid upon it—it was gutted. Even in this condition, however, I can recommend it to any ichthyological friends who may come across it. Its cranial anatomy is very interesting: more especially striking is its formidable dental apparatus, with its broad crushing molars, forming a most effective whelk-mill, while the strong sharp grapplers in front of the mouth must render this powerful fish a dangerous neighbour to its scaly cousins.—*Charles W. Devis.*

Lump Sucker at the Land's End.—I have just had brought to me a specimen of the lump fish or lump sucker. It was alive, and was a female, and had, I think, recently spawned. Its colours were very dull; in fact, a mere dark blue over the head, back and sides, and a dusky white on the belly. It measured over all 24 inches clear, and from eye to fork 18½ inches clear. Both Yarrell and Couch figure the fish exceedingly well, and the only addition I have to make to their descriptions is that, in this specimen, the ventrals were obliterated without junction, or rather were lost in the membrane by which the sucker was enclosed. Probably the great size of the specimen will account for this. The fish was remarkably heavy for its size: it will be stuffed for our Museum here. I do not know that the fish is uncommon, except in this neighbourhood.—*Thomas Cornish; Penzance, April* 1, 1865.

Ostrea virginica, a new British Oyster, at Tenby.—Last year I made a collection of shells in the Bay of Cadiz, where I obtained many specimens of Ostrea virginica, which abounds there, particularly in the tidal portion of the River Guadalete, and grows to a great size, often more than ten and twelve inches in length. These oysters were hitherto unknown or unnoticed in Britain; but, from the many fragments of the shells found by me on the Tenby coast, I was led to suppose that they existed here also; and now, having obtained some perfect and living specimens, I find that I was right in my conjecture. The largest I have as yet obtained is 5½ inches long, 1 inch wide at the hinge, and 1¾ inch when measured at the distance of 1½ inch from the hinge-end or beak, while the broadest part is 3¾ inches in width. The greatest external height of the shell is 1¾ inch. The half-deck-like and grooved hinge (the very distinctive peculiarity of this oyster) is of the usual triangular form, with a deep undulation in the centre, and measures three quarters of an inch in length; that is, from the back, or point, of the triangle, to the front, and 1⅛ of an inch at the broadest part, or base, of the triangle. To avoid any damage to the shell by opening it with a knife, I preferred boiling it, and was therefore unable to draw or measure the animal in its living state; but even though shrunk up by the hot water, it presented a very different appearance from our well-known round Ostrea edulis when similarly treated, being oblong and straight-sided, and measuring 2½ inches in length by 1¼ inch in breadth. The individual which I have described appears to be a young one; for in the full-grown Ostrea virginica of Spain the beak (and with it the hinge) frequently becomes depressed or bent downwards. I have, however, found the depressed end in other smaller specimens at Tenby, one of which, though very small (only 2 inches long by ⅝ths of an inch in breadth), presents the most marked peculiarity of the O. virginica in its long narrow trough-like conformation, scarcely varying in width throughout its length. But here, as in Andalusia, the outline of the shell is very variable in different specimens,—a remark which applies to the whole family of oysters. The septum, or half-deck, which supports the hinge-plate is, moreover, a constant and unmistakeable feature by which to recognize the O. virginica, independent of its other peculiarities. I have also found at Tenby a very small specimen, little more than 1 inch in length by ⅝ths of an inch in breadth, which has every appearance of being a young shell, but which has the "half-deck" with a deep hollow space receding beneath it, and this is prolonged into a tail-like projection, or spur, curving downwards to a length of ⅜ths of an inch, and terminating in a sharp point. The depth of the shell itself is ¼th of an inch. I have not attempted at this season of the year to dredge, so that I have only been able at present to obtain these shells occasionally at low water; but that the O. virginica prefers, in England as in warmer latitudes, the mouth of a river, is shown by the greatest number of specimens being met with in the neighbourhood of the small stream which runs into the sea on the south sands of Tenby. But, as we might naturally expect, the fish cannot exist, in this cold climate, in a shallow and exposed situation; they are not, therefore, found in the stream itself, as they are at the mouth of the Guadalete, where, though every tide on receding from its muddy banks leaves the oysters more or less exposed, they are not affected by the change. Here, at Tenby, even within the influence of the warm current which softens the climate of this coast, they can only exist in a certain depth of water, though probably at no very great depth; but this and other points I can only hope to decide by dredging.—*Gardner Wilkinson; South Cliff House, Tenby, March* 31, 1865.

Note on Coronella lavis.—In Dr. E. Opel's most interesting and valuable account of the habits of the smooth snake (Zool. 9505), he does not mention the fact that it has the power of "stinking *se defendo*" (as White of Selbourne says of the common species). A specimen which I took in August, 1862, in the Valley of the Neckar, gave very disagreeable proofs of its possessing this faculty, nor were our hands freed of the disgusting smell until after repeated washings. This example was about to cast its skin, and where the outer cuticle has been rubbed off the scales beneath show the fine steel-blue tint described by Dr. Opel. The Coronella is not very common in the north of Baden, and seems to be principally confined to the dry, thickly wooded glen of the Neckar. Dr. Opel states that the female lays a number of eggs; one in the possession of Mr. Buckland gave birth to six *live* young ones in October, 1862. May not the truth be that the animal is oviparous, but has the power of retaining her eggs up to the hatching point when in adverse circumstances? Perhaps Prof. Bell could help us to an explanation.—*Edward R. Alston; Stockbriggs, Lesmahagow, N. B., April* 6, 1865.

Note on the Squirrel.—On the 3rd of February I examined a male shot during the late hard frosts, in company with a female. It was strongly in season: the stomach was full of food and the duodenum of chyle. *Query*—Is the breeding time of the squirrel forwarded by a local abundance of food?—*Charles W. Devis; Queen's Park, Manchester.*

On the Food of the Squirrel (Sciurus vulgaris).—Allow me to corroborate the statement, quoted from Tschudi by your correspondent Mr. Alston (Zool. 9484), as to the squirrel sometimes digging up truffles (*Tuber cibarium*). Some years ago, at Elveden, one of my brothers, seeing a squirrel intently scratching a hole in the ground, went to the place expecting to find a nut or an acorn deposited there. To his surprise, there was nothing of the sort, but a freshly dug-up truffle. On his mentioning the fact to me I kept a look out, and it was not long before I watched a squirrel perform the same action. After giving the animal time to eat part of his prize, I walked up and secured some of the fragments. Blasius (*Sæugeth. Deutschl.* p. 274) mentions mushrooms as forming part of the squirrel's diet, but until I read Mr. Alston's note I did not know that any one else had observed it feeding on truffles.—*Alfred Newton; Magdalene College, Cambridge, March* 1, 1865.

Liverpool and other Rats and Salt Water.—Such readers of the 'Zoologist' as reside upon the banks of the Mersey must have been greatly edified (?) by learning (Zool. 9431) that its waters opposite Liverpool Docks at low tide is probably fresh and drinkable, the novelty affording yet another illustration of the adage, "Go from home to learn the news." Whatever may have been the case some two or three centuries ago, when Liverpool was a mere "creke of the Port of Chester," and the tidal influx infinitely less in proportion to the outflow of fresh-water, to say nothing of springs possibly existing in the bed of what was then a river, the idea at the present day is simply absurd and preposterous. In short, the Mersey from Runcorn Gap northwardly (notwithstanding its common designation) is a river no longer. It is a considerable estuary, whose huge volume of brine is and has long been constantly augmenting, through the gradual depression of the land, whilst the extensive lines of quay-walls upon either side have in a most remarkable manner straightened the previously circuitous tidal current here (and main channel), thus effecting an improvement in the natural scourage and deepening of the channel, invaluable to this the first sea-port of England and the world. So much for Mersey water: I now approach, as awe-struck as may be, the "mighty army of rats" asserted by your correspondent's informant to have issued, as if wont, from the warehouses, deliberately crossed the (street and) quay, descended the slip and slaked their thirst with the water there, and thence retired in order due to their several tenements. Desirous of testing, as far as possible, the accuracy of so startling a report, accompanied by a couple of brother naturalists, I called at the hut specified on George's Pier-head, and here met an intelligent official of eighteen years' standing upon this identical location. After hearing the account read, he replied with perfect readiness that certainly he had never seen or heard of aught confirmatory; on the contrary, having formerly been many years upon the high seas, he was firmly convinced that rats would not *drink* salt water, though, like a shipwrecked man upon a raft, they might possibly, when hardly pressed by thirst, taste it *for once*, and this opinion is universal among "old salts." Determined, however, to gain from the public any possible confirmation of the statement, an enquiry from my pen appeared in one of our local newspapers, more particularly addressed to tide-waiters and dock-gatemen, the only reply to which also proves condemnatory of the theory. It elicited the following account, which I have reason to believe authentic:—"A friend of mine, a captain, tried an experiment with a rat during a voyage from this port to New York in the middle of summer. He procured a small box or cage, in the bottom of which he fixed a wine-glass, which he filled with salt water. Having caught a rat, he placed it in the box and kept it in confinement. He is certain, from close observation, that the rat did not taste the water, although apparently it suffered from thirst. After it had been confined a week, he offered it fresh water, a draught of which it seemed only too glad to get. He has also noticed, when in dock, rats descend by the fender-ropes to the surface of the water, but they ascended again immediately." In conclusion, I cannot but fear your correspondent has been imposed upon by some member of another "mighty army," *viz.* that of the "larking swells" of this place, who infest the district worse than any marsupial.—*H. Ecroyd Smith; Egremont, Birkenhead.*

Scarcity of Winter Migrants.—Several correspondents of the 'Times,' 'Field,' &c., have mentioned the immense flocks of redwings, fieldfares, bramblings, &c., observed in some neighbourhoods; here, however, it is far otherwise. Since I have taken an interest in Ornithology, I think, I never remember seeing so few winter migrants as this season. We usually get great quantities of bramblings, but, hitherto, I have not seen a single bird of that species. At the commencement of the winter a few tree sparrows visited our neighbourhood, but did not, as usual, remain through the winter, but took their departure before Christmas, I presume further south. Owing to the severity of the winter, since the commencement of the new year, dozens of fieldfares have perished for want of food; and yet I have not found a single redwing apparently suffering from a like cause: this I attribute to the latter's being more nearly allied to the blackbird and song thrush in its habits, *viz.* by frequenting the bottoms of hedgerows, thereby obtaining a sufficiency of food in the shape of mollusks and the pupæ of Lepidoptera. A few blackheaded buntings have remained with us throughout the winter: I do not recollect ever having seen any here before at this time of year. Even in the present enlightened age, we seem too much in the background to account for the variations in the routes of migratory birds. I think it is generally admitted that their normal course should be due north and south; but where are the migrants which do not deviate, either east or west, from the normal route? This may probably be owing to adverse winds; still our winter migrants are not influenced by the trade-winds, monsoons, &c., of the tropical and sub-tropical regions; in fact, these latter winds will scarcely account for the occasional appearance of North-American birds on our shores. I should be glad to hear what theories have been advanced on this interesting subject.—*Henry Reeks; Manor House, Thruxton, Hants, March* 27, 1865.

Ornithological Notes.—Allow a humble votary of Oology to send you a line or two, in case they may be worth the trouble of insertion in your charming periodical, the 'Zoologist.' The other day, wishing to procure some specimens of the lesser redpole for stuffing, I shot four, one cock and three hens, and on examination, after skinning, the crops of all were full of the seeds of the common bullrush or "bob;" they were shot by myself on the edge of a large pond. I have killed specimens before, together with the siskin, off alder trees, where both seemed busily engaged with the buds of those trees. I can only suppose that the backwardness of the season has prevented these birds from obtaining their usual forage, more especially as there are alders by the pond. Not having my "Yarrell" at home, I have not been able to refer as to whether this information be new or not. I have this moment seen and heard the butcher bird (redbacked). The tree creeper also has begun to build in our summer-house between two pieces of bark.—*W. Jesse, jun.; Maisonette, Ingatestone, Essex, April* 9, 1865.

Backwardness of the Season.—The cold winds and frosts have thrown everything back again, killing many young plants which ventured to peep out in the warmer days we had a week or two ago: the cold since Saturday has been intense. Yesterday I picked up a poor robin quite dead from cold. The thrushes, which began to build some weeks ago, have apparently done nothing lately; a half-finished nest remains now as it was two weeks ago; they are doubtless waiting for more genial weather. A pair of starlings, which commenced building in my house-top on the 10th, and continued for some days, have left to join the flocks of their companions till the winter is over. Not a green leaf can be seen on the hedges, and the gooseberry trees are just bursting their buds. The rooks have apparently just commenced breeding.—*Richard Tyrer; Keighley, March* 22, 1865.

Early Arrival of Summer Birds at Freshwater.—March 18. My nephew shot a chiffchaff and a wheatear on this day, but both species had been seen two or three days earlier. April 3. I was out with my nephew looking for a pair of cirl buntings for a friend, when a single swallow (*Hirundo rustica*) passed us flying east. A yellow wagtail (*Motacilla Rayi*), several willow wrens (*Troglodytes trochilus*) and a wryneck were seen on the same day, also several wheatears: the wryneck is called here the "barley bird." April 4. Several swallows seen and plenty of wheatears. April 5. A large flight of wheatears, a flight of swallows, and some sand martins seen, and a fine male redstart.—*Frederick Bond; Freshwater, Isle of Wight, April* 7, 1865.

Pugnacity of "Cock Robin."—A neighbour of mine having long fed one of these favourites, he became so tame as to enter and remain in the kitchen during the late severe frost. Upon one occasion, when the window had been closed, he espied a rival outside, and immediately became so much inflamed by passion and absorbed in the intruder's movements as to heed nothing transpiring immediately around him, when he was quietly taken by the hand and ejected to finish his "little difference" elsewhere.—*H. Ecroyd Smith.*

Destructive Propensities of the Raven.—I should not have supposed, had I not had evidence of the fact, that the raven could prove so destructive, and that, too, among birds of his own class, as the following history shows. About two years since I had a female raven, bred on the Sussex cliffs, which I allowed to roam at large in my garden, it having its wing cut. In July, 1863, a young herring gull, from the same locality, was procured and placed in the garden as a companion for the raven. For a long time these continued to live very amicably together. In August, 1864, another young herring gull was added to their number, and the three confined in an ample space, enclosed with a wire fence, in which was an artificial pond, and where all delighted to perform their ablutions. The last comer was the cock of the walk, and when he pleased would keep both raven and elder gull at a respectful distance. The first evidence of the raven's destructiveness was evinced by its attack on an unfortunate jackdaw, which happened to stray into the garden from a neighbouring cottage: this bird was speedily killed, picked and devoured, much to the chagrin of its owner, a boy, who prized it highly. On the 3rd of February, in this year, I made an addition to this happy family, in the shape of a very interesting little specimen of the common gull (*Larus canus*): this pretty creature was soon quite at home with the other birds, and all agreed pretty well for a few days, when one morning I was horrified at seeing wings, tail and feathers scattered about on the snow, the body having been picked and devoured. This so annoyed me that I had the raven driven out from the enclosure into the open garden; but this only made matters worse, as two days afterwards the older of the herring gulls, getting into difficulties by thrusting his head through the wire fencing, from which he was unable to extricate himself, was attacked by the raven, and before relief could be afforded, had his scalp torn off and the skull perforated by the powerful beak of its antagonist. About this time also a tame sparrowhawk belonging to the owner of the jackdaw before mentioned, was in the habit of coming into the garden; and, having duly cautioned the owner of the fate which awaited his bird if he did not confine it to his own premises, it was allowed to stray once too often, and speedily met the fate of the other birds. I was very anxious to save the only gull I now had remaining, yet very unwisely allowed the two birds to remain together in their enclosure, feeling confident in my own mind that, from the pluck and size of this gull (he being a larger bird than the raven), he would be able to take care of himself if he had but fair play. In this I was unfortunately mistaken, for a few days since, without our being made aware of any quarrel by the cries of the bird, we found the poor gull picked and partly eaten, which operation must have been performed very expeditiously, as it had been seen alive but a short time before. It would be interesting to know, from anyone who has had experience in keeping ravens with other large birds, and where, as in this case, they have lived amicably together for a considerable time, if it is usual for this destructive propensity to become suddenly developed. In this case, the thirst for blood being once roused, it was carried to the extent of destruction of every bird which came in the raven's way, in spite of a liberal allowance of meat, fish, &c., with which it was regularly supplied.—*James Dutton; Hammersmith, March*, 1865.

Sand Grouse, &c., near Keighley.—I have just seen, in the shop of Mr. Gott, bird-preserver, of Keighley, a fine specimen of the sand grouse: this bird, the only one seen, was killed on Oakworth Moor, near here, in June, 1863, and brought to him for preservation. He has also a rednecked grebe, shot in the River Aire in the winter of 1848: I believe it to be a female in its winter plumage, though time and light have so faded its colours as to make it somewhat difficult to distinguish. In March, 1859, a roughlegged buzzard was shot on Cullingworth Moor, and was preserved by him:

he has it still; it is a very beautiful specimen. He tells me he had once for preservation a hoopoe, the only one seen near here, which was shot at Ainsworth Shaw on the 14th of April, 1851. Mr. Gott is a very intelligent man, and well acquainted with the Ornithology of this district.—*Richard Tyrer; Keighley, March* 22, 1865.

Malformation of a Snipe's Beak.—Last February, along with five brace of ordinary billed snipes, I shot one with the beak so curiously formed that I made a note of it for the pages of the 'Zoologist.' A snipe, making a very peculiar cry, rose some seventy or eighty yards from me, and pitched again about a quarter of a mile distant. On reaching the place, my red setter "Dan" brought up with a dead set. The bird rose, emitting the peculiar cry "ku ku," and fell to my first barrel. Never hearing a snipe utter this note, I was confident of a *rara avis*, but on picking up my bird all thought of Sabine's and the brown snipe vanished: my bird was only a common Scolopax gallinago, a pale variety, and a bird of last year, but with a most peculiar beak; in fact, a perfect "recurvirostra," similar to no bird I know but the avocet. This peculiar formation of bill accounted for the strange cry. So perfect is the turn of the beak in both mandibles, that if the bird had been shot in any foreign country, it would be considered most probably a distinct species.—*H. Blake-Knox; Dalkey, Co. Dublin, March* 18, 1865.

Solitary Snipe near Thetford.—It may interest the readers of the 'Zoologist' to hear that on the 13th of March I saw, on the Little Ouse, near Thetford, a solitary snipe (*Scolopax major*): it rose within ten yards of me from a marshy place. I noticed particularly its steadier flight, the white on the tail, which it carried in a curious manner, the greater distinctness of its markings, and its greater size, as compared with the common snipe.—*M. R. Pryor; Croxton, Thetford, March* 14, 1865.

Abundance of Jack Snipe during the past Winter.—I can also bear witness to what I have seen recorded by several observers respecting the abundance of jack snipes during the past season. As is always the case when the smaller species is plentiful, the common snipe has been unusually scarce even in the Somersetshire peat-moors, one of its most favourite haunts in the kingdom. At Christmas time a full snipe was not to be bought anywhere in the fens. All through the winter in this neighbourhood jack snipes have been in the proportion of at least four to one common snipe. Last October the fens were so dry that there was no feeding for snipes. Consequently the birds in their autumn migration went elsewhere, finding themselves disappointed in what in ordinary seasons has always been a rich feeding-ground. The heavy snow-falls at the beginning of the year brought the fens to their customary state of moisture, and thus, on their way northwards to breed, many snipe were led to visit them, and at the end of last month and the beginning of this better sport has been had among the long-beaks than at any other time during the season.—*Murray A. Mathew; Weston-super-Mare, April* 11, 1865.

Spoonbill near Helston.—An unusually adult spoonbill was killed, on Tuesday last, on the banks of the Loe Pool, a lake barred off from the sea by a mound of shingle, about two miles from Helston. The occipital crest is about three inches long, and probably would have been far better developed in another fortnight.—*Edward Hearle Rodd; Penzance, March* 24, 1865.

Ruffs and Reeves in Cornwall.—I observed at Mr. Vingoe's laboratory two ruffs, one with the head and neck white, and apparently preparing to turn out the ruffed feathers. I am not acquainted with this bird in its nuptial dress; those that have appeared here have been almost entirely in the winter; the specimen now under notice gives me the idea of being a bird of last year, and that the *full* ruff will not appear. How old are the male birds before they put on their full *court* dress?—*Edward Hearle Rodd.*

Note on the Rednecked Grebe.—During the last three weeks I have bought five specimens of this bird in the Birmingham fish-market, three of which were killed on the Fern Island, Northumberland, and sent here from Scarborough with fish. The three killed on the Fern Island, two males and a female, I bought on the 3rd instant: the female measured, from tip of bill to rump, 1 foot 5⅜ inches, and weighed 1 lb. 5½ ounces; one of the males 1 foot 5⅞ inches, and weighed 1 lb. 7½ ounces; the other 1 foot 7½ inches, and weighed 1 lb. 12 ounces. The remaining two I bought on the 20th instant; one measured from tip of bill to rump 1 foot 6 inches, and only weighed 1 lb. 2½ ounces; it was in a very emaciated condition: the other weighed 1 lb. 12½ ounces, and measured 1 foot 7 inches. Is not the male measuring 1 foot 7½ inches from tip of beak to rump a large bird? I observe Mr. Morris states the length of the male is from 1 foot 4½ inches to 1 foot 6 inches.—*C. B. Hodgson; Hunton Hill, near Birmingham, March* 21, 1865.

Great Crested Grebe in Warwickshire.—A fine bird of this species, in beautiful clean plumage, was killed on the 5th of March, on the reservoir near Earl's Wood, Warwickshire: it measured from tip of beak to rump, 1 foot 10¼ inches. I have in my collection another, though not so fine a bird, which was killed in the same place in 1858.—*Id.*

Sclavonian Grebe near Salisbury.—As I believe this grebe is not frequently found inland, I thought its occurrence near this town might be interesting to some of the readers of the 'Zoologist.' On the 11th of February I was walking on the banks of the River Avon, about two miles from this town, in some of our beautiful water meadows, when I saw, at some distance off, a bird which I at first took for a dabchick, which are very numerous about here; but, as I found it did not dive on my nearer approach, I looked again, and at once guessed what it was. I had a young friend with me, whom I immediately sent to obtain a gun, and during three-quarters of an hour the bird allowed me to keep it within twenty yards of the same place, by walking at some little distance off the bank and heading it back as often as it had swam two or three yards off. It certainly (according to Meyer's description of it) does not seem to share in the shy nature of the other grebes, especially as I apparently missed it with the first barrel, on which it dived about four yards and came up again, when I killed it. I should think it a male bird in winter plumage; length 13 inches; the feathers on the head beginning to assume the appearance of a crest; breast and all under parts pure silvery white; top of head and all back parts dark, approaching nearly to black, the edges of the feathers being slightly lighter. The iris of the eye has a narrow circle of yellow round the pupil, and the rest carmine-pink, pink flesh extending also from the beak to the eye, and in a slight degree under the beak.—*Arthur P. Morres; Salisbury.*

Note on the Great Crested Grebe.—A beautiful specimen, procured from the person who shot it on Gorton Reservoir, near this city, was lately offered in Manchester Market. It is a female, in the second year's plumage, and most probably a straggler from Rostherne Mere, the nearest of their breeding-places: it was in capital condition, yet the stomach contained the largest and most compact mass of feathers that I have observed in these birds: there was no admixture of food, nor indeed any room for it. This feather-mass in the grebe's stomach is a matter requiring elucidation. The feathers are supposed to be the bird's own, and further supposed to be swallowed accidentally in the act of preening, and still further supposed to be regurgitated together with fish-bones, &c. The first part of the theory is, I think, correct; the second is, to say the least, extremely doubtful; it might be allowed to account for a few feathers or occasional feather-pellets analogous to the hair-balls of ruminants, &c.; but it would seem passing strange that so large a quantity of feathers should be constantly swallowed by accident—an accident occurring seldom or never to similar birds with similar mandibles, plumage, food and habits. As to the supposition of ejectment upwards, can any one supply an observation of the fact? In other divers, at least, the passage of the whole of the fish-bones through the intestines can be demonstrated. In a second specimen procured in the market the mass of feathers was much less compact, and mixed with it were vertebræ and cranial bones of two small dace. Two other specimens have been offered for sale, but their condition precluded purchase. The skeleton of the grebe affords the ornithologist many highly interesting points of observation.—*Charles W. Devis; Queen's Park, Manchester, March* 11, 1865.

Note on the Blackthroated Diver.—With the three grebes killed on the Fern Island came a blackthroated diver, also killed there. It was a male, and measured from tip of bill to tip of tail 2 feet 2¾ inches, from tip to tip of outstretched wings 3 feet 9½ inches, and weighed 4 lbs. 9 ounces.—*C. B. Hodgson.*

Ivory Gull at Weston-super-Mare.—One day last month a magnificent specimen of the ivory gull, in full mature plumage, was shot on the little island of Birnbeck at this place. This is the second adult ivory gull which has been obtained at Weston-super-Mare within the last few years.—*Murray A. Mathew; April* 11, 1865.

Ornithological Notes from Shetland. By H. L. SAXBY, M.D.

(Continued from page 9526).

FEBRUARY, 1865.

Hooper.—It is so seldom that hoopers arrive here on their way northwards before the middle of March, that the appearance of a small flock so early as the 8th of February can only be considered as accidental. They alighted upon the voe at Baltasound about an hour after sunset, and on being disturbed early next morning flew off to a loch about a couple of miles distant, and settled upon the ice. Some people who happened to be passing that way very nearly succeeded in catching them in their hands, for the hoopers, being either unwilling or unable to rise from the frozen surface, shuffled awkwardly to the shore before attempting to take wing, but once clear of the ground they flew away with their accustomed vigour. Although it was dark when they arrived their peculiar cry at once betrayed their presence. So far as I am aware they always rise facing the wind; therefore, in shooting them from the land, one can often obtain a fair shot by running in from the windward side and waiting until they pass overhead. This plan will answer even when they are sitting far out of shot from the shore, for they rise so heavily that only a very slight elevation is attained by the time the first fifty or sixty yards have been traversed. For similar reasons, sailing down upon them before the wind affords a good chance, but an opportunity of doing so very rarely occurs, owing to their preference for the lochs.

Peregrine Falcon.—Birds of this species have been seen in couples all the winter, but I have had no means of ascertaining whether these were *pairs*. In Shetland, as in most other places, conjectures as to the sex of a bird are so frequently erroneous, that although the statement of the inhabitants that the peregrine "pairs for life" is probably correct, it still requires confirmation.

Heron.—Herons have not yet left. Flocks sometimes numbering as many as twenty or thirty individuals are often met with near the sea, sandy bays being preferred, especially such as are sheltered from the wind. Low tides frequently tempt these birds to seek their food among the rocks, although the slipperiness of the latter seems to render their footing somewhat insecure. It is amusing to see a heron running over them suddenly fall flat upon its side, a mishap that I have witnessed more than once, but upon no occasion did the bird make the slightest exertion to save itself by means of its wings. In every specimen which has fallen into my hands, the claws, and especially the hind ones, have always been much worn and blunted, as though they had been ground down upon a coarse stone. In one, shot last autumn, the claws had become reduced to mere stumps.

Glaucous Gull.—There are still many glaucous gulls remaining, but these are nearly all young birds, none of the old ones which left us early in the season having yet returned.

Greenfinch.— A few greenfinches are still lingering about the gardens. All of those which flew into the houses and were captured have now become quite tame; but the old males at first displayed considerable unwillingness to submit to restraint. Their chief food is oats, of which they appear to be extremely fond.

Fieldfare.—Early on the morning of the 15th of February (wind S.E.) about five hundred fieldfares arrived. Early next morning the wind had changed to N.E., but not one was remaining.

Common Bunting.—Several flocks of common buntings appear here every winter. A few days ago an individual of this species, having the middle of the back perfectly white, was seen by me in the garden, where, singularly enough, I observed either that same one, or another marked in a precisely similar manner, four years ago. As upon the present occasion, it only remained for a short time, but none like it have been seen during the interval.

Rock Dove.—Rock doves are still in very large flocks, but couples are frequently observed, especially near the caves. Couples are also constantly to be seen arriving among and departing from the main body. At almost all seasons I have seen them in what I supposed to be pairs, a supposition which dissection has invariably proved to be correct, so far as may be judged from the fact that they were of opposite sexes. Unfortunately, I have in many instances omitted to notice their age; therefore it is quite possible that some of the supposed pairs were merely couples of young birds from the same nest.

Scaup Duck.—Scaups are never abundant in this neighbourhood, but this winter they are unusually scarce, although two or three are always upon the voe. I have never seen them here in flocks, even in the most favourable seasons. They prefer the sea to the lochs, and approach the shore mostly at high water, the chief attraction being the mouths of burns, but for what reason it is difficult to say, for in the stomachs of those killed in such places I have never found any article of food which could not have been readily procured in salt water. Their curious habit of stretching forward the head, and at the same time opening the bill, has often been remarked; but here at least, although it is most frequently exhibited in spring, it is certainly not peculiar to that season alone. The scaup is an excellent diver, and when near the shore (the only situation in which I have timed its movements) it continues submerged for about twenty-four seconds. Although it is decidedly less shy than most other ducks, it is generally sufficiently upon the alert to be able to escape the shot by diving to the flash. In the stomach of an adult male which was killed on the 28th of February, I found sand, shells, and the remains of crabs.

Cormorant.—I first observed cormorants in spring plumage about the end of February, by which time the few scattered white marks upon each thigh had given place to a distinct white patch.

Herring Gull and Lesser Blackbacked Gull.—About the end of September the head of the herring gull becomes spotted with dark gray. On the 27th of February I first shot specimens having the head quite free from those spots, although but a few days previously not one whiteheaded bird could be obtained. Precisely similar changes occur in the tame lesser blackbacked gull at Halligarth. In it the last dark spot disappeared on the 25th.

Guillemot.—Guillemots are returning to Burrafirth in considerable numbers; but they are never seen upon the rocks until much later.

Purple Sandpiper.—Purple sandpipers are still numerous, and, judging from their movements in former seasons, they will yet remain with us many weeks. Specimens shot a few days ago differ but little in appearance from those which were procured in early autumn, except that, after the wear and tear of the winter, the plumage has lost a good deal of its gloss, and the edges of the feathers are rather worn. In Hoonie, where these birds are but little disturbed, they are exceedingly tame. By allowing the boat to drift past the rock upon which they were standing, I have sometimes almost touched them with the rested oar. Sometimes instead of flying off they merely crouch among the sea-weed.

Hooded Crow.—This hard weather is driving the hooded crows to the sea-shore. Many of them are in couples, but there are still some flocks of considerable size. Macgillivray states that they remain paired throughout the year, and I have been told that these flocks are composed of young birds only. I know one pair well by the broken leg of the male, and these two most certainly remain together all the year. The well-known habit of breaking open shells by dropping them from a height upon the rocks may be constantly observed here. Not only shells, but bones also are treated in this manner, the bird rising to the height of about fifty feet, sometimes much less, and then letting them fall, following them very closely in their descent. I have read a most vivid description of the process, concluding with an appropriate remark upon the wonderful instinct which leads the bird to select a spot suitable for the performance, together with one upon the marvellous accuracy of its aim. Perhaps my opportunities have been less favourable than those of other observers, but unfortunately I have repeatedly seen the bone or the mollusk dropped upon soft sandy ground, and even upon short grass. In most cases, however, it has been dropped upon the shore, where a nice aim indeed would be required to avoid the stones. Once I saw a hooded crow drop a piece of bone upon the only patch of sandy ground on a long line of rocky coast, and it was only after frequent and persevering trials that the bone was accidentally broken upon a small rock. Now had that spot been the only *rocky* one in the neighbourhood, or even had it been occupied at the time by some Shetland Æschylus, I should doubtless have lost no time in presenting a full account of the fact to the readers of the 'Zoologist' in illustration of the almost human sagacity displayed by the hooded crow.

Raven.—Ravens seem fully to appreciate the time-honoured remark as to the propriety of having "two strings to one's bow,"—indeed many of them have at least half a dozen. Unlike the crows, they are very seldom driven by the weather to seek their food by the sea-side, for the raven's harvest only begins when snow and wind compel weakly and starving animals to creep to the walls for shelter. Failing these, poultry and eggs can always be procured, and there is always corn to be had in the yards. They have already committed considerable damage. Scarcely a sheep or a pony lies down exhausted with cold and hunger without being attacked and blinded by these mischievous birds, and then left to certain death. Many attempts have been made to drive the ravens from Shetland, but they have invariably failed. Traps are almost useless, and guns, if effectual for a time, soon become equally so. Poison would no doubt fully answer the purpose; but whoever used it would be considered responsible for every death which might occur in the farm-yards for many years afterwards. It is by no means difficult to get within shooting distance of young birds, but the old ones are extremely wary, especially in those parts where guns are much in use. Even when they are feasting upon carrion at the foot of a high wall, it is not often that they can be approached, for so suspicious are they that they will constantly interrupt their meal by rising upon wing for a few feet, and then if the expectant gunner be observed his chance is lost. Occasionally, however, this habit defeats its own purpose, for when there happens to be any place of concealment within a hundred yards or so of the spot it is easy to run up as the bird disappears, and thus make certain of a shot. In a case of this kind, the raven is always sadly "taken aback," and seldom fails to utter a confused croaking sound as he clumsily endeavours to fly off, his own haste only serving to increase his embarrassment. I have often succeeded in shooting them by hiding among the bushes at Halligarth, or by crouching in the angle of a wall which lies in their track, for they have regular hunting grounds, which they traverse most methodically several times in the course of the day. An angle formed by the junction of two walls forms an excellent hiding-place, the side which is selected depending upon the direction of the wind, for ravens, like most other birds, greatly prefer flying to windward. When engaged in hunting they scarcely ever cross a wall abruptly; their habit is to sail slowly along its top, keeping exactly above it, and following every bend so as to be able to inspect both sides at once. When larger game does not meet their view, there is always a good chance of poultry. It is probable that in these situations they procure the field-mice which are sometimes found in their stomachs. Ravens seem to be well aware how near they may approach man with impunity. A gunner is kept at the respectful distance of about eighty yards, field labourers are regarded with less caution, but a rider will not cause any alarm before he is within easy stone's throw. Some years ago I accidentally discovered a very successful mode of shooting them, the only objection to it being the expenditure of time which it occasions. I was lying upon the heather, keeping my gun beneath me to shelter it from a slight shower, when five ravens appeared in the distance, and soon catching sight of me they commenced hovering and croaking overhead. Their curiosity was evidently excited, and they showed every disposition to cultivate a closer acquaintance; but although I stirred neither hand nor foot, about half an hour passed without any further advance upon their part. Presently the profound truth dawned upon me that dead animals never move their eyes, and accordingly, to make the resemblance as complete as possible, I nearly closed my own. Very shortly afterwards they began to wheel nearer, croaking more loudly than before, and occasionally alighting upon a distant hillock, and at last, when they came within easy range, I started up suddenly, and killed two. Upon several other occasions I have shot them in a similar manner, but they never come within reach either when the gun is exposed to view or when my eyes are open. Although they are so cautious upon these occasions they will fearlessly approach a pony even when it is giving very evident signs of life. A raven will often sit until a dog is almost within reach, and then rise slowly and with apparent carelessness; but this indifference is only assumed, for an aggressive movement on the part of the dog is nearly always accompanied by a hurried ascent upon that of the raven. Sometimes, however, as in a case which occurred here a few years ago, the raven's impudence brings its own punishment. A dog which had long been very much annoyed by one of these birds, which frequented his master's farm, suddenly gave up all attempt at retaliation, and was repeatedly seen to proceed upon his way with great apparent unconcern, although his tormentor was evidently using every means to provoke the usual snarl and its accompanying unsuccessful spring. Seemingly in despair of ever being able to grapple with his enemy, the dog could never again be enticed to forget his own want of wings, and consequently the raven grew bolder and bolder, hopping along almost beneath his very nose, and sometimes even striking him with its claws. One day, however, as the dog was passing along a low turf-wall, the raven thought fit to repeat the performance, keeping most provokingly a little in advance, and occasionally varying the amusement with a croak or a sly pounce. The dog trotted along as briskly as usual, looking neither to the right nor to the left. Then the raven, making a short circuit, again assailed him from above, and, passing over his head, was about to alight deliberately upon the wall, when the dog, making a mighty bound forwards, seized his enemy by the wing, and tore him literally to shreds.

HENRY L. SAXBY.

Baltasound, Shetland, February 28, 1865.

Ornithological Notes from Lanarkshire.

By EDWARD R. ALSTON, Esq.

(Continued from page 9442.)

Rook.—Rooks have now eggs; these vary much both in form and colour. I have one in my collection which is hardly larger than a song thrush's, and nearly oval in shape; others, again, are much elongated and pointed. A curious emigration of this species took place here a few years ago. A colony had seceded from the old rookery, and established themselves on some trees which were overlooked by a high bank; here they remained for a year or two, but one spring they were much persecuted by boys throwing stones into the nests from the bank above, and in one day the whole of the colonists deserted their nests (although many of them had nests), and went over in a body to a wood at Douglas Castle, six or seven miles distant, where they founded a new settlement, and have remained ever since. Here, as throughout Scotland, the rook is popularly known as the "crow," or "craw," the carrion crow being called the "huidy craw," while the true hooded or gray crow is almost unknown. The raven was formerly found in our hills, but seems now to be quite extinct. Perhaps I may be allowed to suggest that your contributors of "Ornithological Notes" should mention the local names of the various species, a subject of some interest, and one which has been much neglected in this country.

Jackdaw.—We have a good many of these quaint and self-satisfied birds; some build in deserted rooks' nests, others in hollow trees, whilst others, I am almost certain, build for themselves. The males of this and the preceding species feed their mates at this season by regurgitating the food from their crops. The jackdaw is rather a pugnacious bird at all times, but in the building season a convenient hole in a tree is sure to set two or three pairs at loggerheads. I was much amused by such an encounter the other day; one pair had taken possession of a hole, where they were besieged, or rather blockaded, by another couple; every now and then a black head would appear at the entrance,—"kieugh, kieugh!" the attacking party were at it directly,—but the first pair had the best position, and were finally left in peace.

Wood Pigeon or Ring Dove.—These birds are also now sitting: the great warmth of their eggs when fresh from the nest must be familiar to your egg-collecting readers; probably this unusual amount of animal heat in the parent bird may be the reason why it builds so slight and cold a nest. Large flocks of wood pigeons arrive here about the middle of July to feed on the ripe blae-berries, on which they grow very fat: where these numbers come from I cannot tell. The Scotch name of "cushie," or "cushie-doo," is evidently a form of the old Saxon "cushat."

Curlews and Peewits.—Curlews and peewits arrive here to breed about the beginning of March, from the sea-coast and lower country. Both species are very noisy about nightfall, and even long after dark. The cry of the latter by night seems to me to sound quite differently from that uttered by day, being much more sharply and harshly intoned. The Scotch name of the curlew is the "whaup," which is doubtless derived from its low inward cry of "whau, whau, whau-u," seemingly a call to its mate, and very different from its loud and peculiar whistle.

Woodcock.—Like the fieldfares and other winter visitors, the woodcocks arrived this winter in considerable numbers, nor have they left us yet. Occasionally a pair remain to breed in this neighbourhood, but I have never yet been fortunate enough to find a nest. I noticed a remarkably pale variety of this bird lately in a shop in Glasgow; it was light brown above, with hardly any dark markings, lower parts almost white.

EDWARD R. ALSTON.

Stockbriggs, Lesmahagow, N.B.,
April 11, 1865.

Ornithological Notes from Lincolnshire. By JOHN CORDEAUX, Esq.

(Continued from page 9538.)

Green Sandpiper.—This beautifully marked bird, the most interesting of the Tringæ, is by no means uncommon in North Lincolnshire. One or two pairs of these birds may generally be found on a small stream which forms the eastern boundary of this parish. It is not, I think, improbable that they breed in the neighbourhood, as it contains several quiet retreats well adapted for this purpose: I have seen a pair of green sandpipers on our stream as late as the 5th of May; and two or three years since, in August, put up five of these birds altogether, probably a young brood, from the side of an osier bed. Often when first flushed they fly low down near the water, following the windings of the "beck," and then suddenly pitch down on some little mud bank. When repeatedly disturbed, however, they rise high, flying round the intruder in a wide circle, all the time uttering their wild shrill whistle, and then going straight off to some distant part of the stream. These birds feed by night as well as by day, as I have occasionally on moonlight nights put them up from the shallows in the streams, their well-known cry being then the only means of distinguishing them from a snipe.

Golden Plover.—A specimen of this bird was sent to me on the 1st of April. It had been shot in the marshes, and is probably the last I shall have an opportunity of examining this season, as in the course of a few days they will have left the neighbourhood. I once, however, saw a solitary specimen in full summer plumage as late as the 10th of May. As yet this bird shows but little signs of any change in plumage. On pulling out, however, one by one, the white feathers from the under parts I found the young crop coming underneath, the black feathers just bursting out from their blue sheaths. There did not, however, appear to be a sufficient growth of these new black feathers to make up the full summer plumage. Probably, as some ornithologists assert, the deficiency is made up by many of the white feathers becoming changed by the black pigment from white to black. In the bird I examined a considerable portion—at least two-thirds—would have been entirely new feathers.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire.

Ornithological Notes from Norfolk. By HENRY STEVENSON, Esq.

(Continued from page 9496.)

Rednecked Grebe.—In looking over my notes for the last two months (February and March), the most noticeable fact is the extraordinary number of rednecked grebes which have visited our coast during a period extending from about the first week in February to the 25th of March. A few specimens invariably visit us in the winter months, though but rarely remaining late enough in the spring to have acquired the rich red throat of the breeding season; but their numbers of late, judging merely from the specimens brought to our birdstuffers for preservation, or exposed for sale in our markets, have far exceeded anything I have previously witnessed, or of which any local record, to my knowledge, exists. I have myself examined, or have heard of on reliable authority, at least five and thirty examples, brought into Norwich alone, a large proportion of them between the 18th and 28th of February, when from eight to ten were seen in a week, and these have been brought, with but few exceptions, from the immediate vicinity of the coast, as at Yarmouth, Salthouse and Blakeney. These would appear to have formed a part, and probably a considerable part, of a large flight, which, from some cause difficult to arrive at satisfactorily, has visited our eastern and south-eastern counties during the late severe winter, as from previous notes in the 'Zoologist' I find they were simultaneously met with in Yorkshire and Lincolnshire, and others were observed at the same time in the markets of Cambridge and London. Of those killed in Norfolk the chief portion appears to have been adult birds in full winter plumage, with perceptible tufts on either side of the head, and their throats grayish brown. Here and there a bird showed slight traces of the red patch, but not more amongst the early than the later specimens, as of the two I noticed myself as having most red on the throat, one was killed on the 10th of February, the other on the 28th; and an old male shot on the 25th of March showed no indications whatever of this nuptial tint. The stomachs of these birds, as usual, contained a mass of long curled feathers, closely matted together, and stained a bright green from some minute vegetable substance, apparently confervæ, from the surface of the water. Mixed also with these were small flinty particles, but, in such at least as I examined myself, no further indication of their usual food than a strong fishy odour.

Brambling.—These birds have been extremely plentiful throughout the winter. Several still seen up to the 25th of March, the male birds fast assuming the black head of the breeding season. Mr. Samuel Blyth, a good naturalist and a very accurate observer, assures me that whilst staying at Framingham, near Norwich, towards the end of January, just previous to the late severe weather, he observed for several successive days immense flights of birds passing low over the fields in a southerly direction, and always about the same time, between three and four o'clock in the afternoon. Being desirous of knowing what they were he stationed himself under a fence, near their ordinary course of flight, and, making a long shot, succeeded in dropping a single bird, which proved to be a brambling. On the following day he repeated the experiment with the same result; and still at the usual time, from about half-past three till dusk, these birds kept passing on in one unvarying line, and continued to do so for about a week. Although fully believing from the first that these were migratory flocks, he was sufficiently interested in the matter to watch all one day, from the early morn, to ascertain if any of them would return again, but not one appeared till the afternoon, and then as before in large numbers and in the same direction.

Great Gray Shrike.—A single specimen of the gray shrike was killed at Hathersett, near Norwich, on the 14th of February.

Storm Petrel.—The only bird of this species I have heard of during the past winter was picked up dead on Kelling Heath, near Holt, about the end of last year, and was sent to Mr. Barlow, of Cambridge.

Redbreasted Merganser.—On the 4th of February I saw a splendid adult female in our fish-market, having a rich buff tint on the breast, quite as vivid as in some males, and a similar bird from Barton Broad was killed on the 9th of March. Two fine old males, in full plumage, were sent me from Salthouse on the 14th of February.

Goosander.—An adult female killed at Holkham about the 11th of February; a fine old male, near Lynn, on the 2nd of March; and two males, one adult and one immature, at the same place, on the 11th of March.

Smew.—On the 10th of February two immature specimens of this bird were exposed for sale in the Norwich Market. On the 17th a beautiful adult male and a young bird were killed at Yarmouth, and an adult pair at Southery on the 27th.

Divers, Black and Redthroated.—On the 4th of February a black-throated diver for sale in our market, having a perfectly white throat and a few white spots on the wing-coverts. On the 11th of February one specimen from Holkham and two from Gaythorpe, Suffolk, with white throats and no white on the upper parts. On the 18th of March a redthroated diver was killed somewhere on the coast, in full winter plumage, the throat white and the feathers on the back broadly tipped with the same.

Cormorant.—A remarkably fine specimen of this bird, in full breeding plumage, with much white on the head and crest, and the patches on the thighs very pure, was killed near Hoveton Broad on the 23rd of March. It is said to have frequented that neighbourhood, in company with another bird, for more than a week; but they were far too wary to come within shot of the keeper, who only procured this one by having them driven over his head as he laid in ambush. This species is now rare in Norfolk, and particularly in mature plumage. On dissecting the above I found it to be a female, with three eggs, varying in size from a small marble to a pea, besides a large cluster not bigger than a pin's head. The stomach was quite empty, and though, from its perfect plumage, the bird might have been considered in good health, the internal parts showed evident signs of disease.

Sclavonian Grebe.—An adult male, in full winter plumage, killed on the Norwich River, near Coldham Hall, was brought to me on the 27th of February. The stomach contained nothing but feathers, as usual stained with green and having a brackish smell.

Velvet Scoter.—Another adult male was purchased in our fish-market on the 27th of February, but was not so rich in colouring as that previously described (Zool. 9495). The plumage had a decidedly weather-beaten appearance, which is particularly observable in the common scoter after long-continued and severe frosts. The stomach contained minute fragments of shells and portions of small crabs' claws.

Wild Swan.—An adult Bewick's swan, shot at Ludham, was exhibited in the market for sale on the 4th of March, and a fine hooper on the 20th. Two or three others have also been killed near Yarmouth, and one at Burlingham.

Wild Geese.—With the exception of a few brents, we have had scarcely any wild game brought to our market this winter, in spite of the severe weather. I have seen only one bean goose, and that on the 18th of March.

HENRY STEVENSON.

Norwich, March 31, 1865.

Ornithological Notes from East Sussex. By JOHN DUTTON, Esq.

Wild Geese. On the 13th of February large flocks of wild geese were seen flying westward, but some distance "off at sea." It was a bitter cold day; snow about two inches deep.

Wild Duck.—On the 14th of February several were shot at the Crumble Pond: one man shot four.

Wild Swan.—On the 20th of February a small flock were seen flying over the Crumbles.

Eagle.—A large eagle, probably Haliæëtus albicilla, was seen at Cuckmere Haven and Seaford for several days in succession, in January last. It was also seen off the Wish Tower here on the 17th of January. There is scarcely a winter but one is seen at this place, although seldom procured.

Brambling.—On the 29th of October, 1864, Mr. Bates, the bird-stuffer, brought me two mountain finches, shot at Compton Place, the seat of Mr. F. Howard.

Spotted Crake.—On the 31st of October I inspected two spotted crakes, shot at Wallsend, Pevensey, a day or two before. They are in the possession of Mr. Bates.

Velvet Scoter.—On the 2nd of November I purchased a fine female velvet scoter shot off here on that date by Mr. H. Sayers, a fisherman.

Snow Bunting.—On the 1st of November two snow buntings were seen here. They always occur here in hard winters, but not in great numbers. Numbers have been seen since that date.

Merlin.—On the 6th of January last Mr. Bates brought me for inspection a splendid old blue-backed merlin, shot at Abbott's Wood a day or two previously.

Rock Dove.—On the afternoon of the 23rd of January Mr. Harrison shot a fine specimen of the rock pigeon at Bell Tont Lighthouse, and which he presented to me. On the 25th another specimen was shot at Holywell.

Woodlark.—On the 31st of January Mr. Bates brought me a specimen of this bird, shot near here. On the 25th of January, when out shooting, I saw a small flock of woodlarks in a field where I had killed four or five in the severe winter of 1859-60. They are easily distinguished from sky larks on the wing by their smaller size and shorter tails. I believe they are generally to be met with here most winters if looked after.

Smew.—On the 18th of February Mr. Bates had brought him a beautiful smew in the immature plumage. Old males in the white dress are rare here, as I believe elsewhere.

Redthroated Diver.—On the 18th of February I purchased a beautiful specimen of the redthroated diver, picked up near the Redoubt by a fisherman. There are hundreds off here in the sprat season, and as there were 10,000 mackerel caught off Beachy Head the day previous by one boat, it is probable that Mr. "Herring Bar," as the fishermen here call them, was after the mackerel.

Fieldfare.—Large flocks were about here during the late snow and frost.

Redwing.—More than usually numerous this winter. I have seen hundreds.

Golden Plover.—Great numbers have occurred this winter in our marshes and fallows. They are always winter visitants to these parts.

Very few rare things have occurred here this winter, which, considering how rich this district is in Ornithology, seems strange. Last year three bitterns were shot, but I have not heard of a single specimen having been killed this winter.

JOHN DUTTON.

51, Terminus Road, Eastbourne,
February 20, 1865.

Ornithological Notes from West Sussex.
By W. JEFFERY, jun., Esq.

(Continued from page 9498).

FEBRUARY, 1865.

Nuthatch.—The stomachs of two of these birds which I examined contained a considerable quantity of small gravel and small pieces of red brick, which seemed to have been worn smooth by the action of the gizzard. In one I found also some pieces of acorn? and one or two small seeds, and in the other a spider and two spiral snail-shells about a quarter of an inch long and a twelfth of an inch wide.

Peewit.—A large flock were seen on the 6th and 10th of February; after this a few, perhaps from twenty to fifty, were seen at different times up to the 24th; none seen after this latter date.

Golden Plover.—From the 16th to the 18th of February a flock of from seventy to eighty was seen. I have been told that much larger flocks were seen throughout the month, up to about the 25th, in the Manhood, but they have now entirely disappeared.

Grebes.—A specimen of the Sclavonian grebe, in the winter plumage, seen on the 1st of February: it had been recently killed on the coast. A great crested grebe, having a good bit of the chestnut colour about the head, but not much crest, was killed about the 22nd of February.

Redthroated Diver.—One seen in Chichester Market on the 22nd of February. This species has been scarce on this coast during the past winter: I have not seen more than three specimens all through the winter, and in these the red patch on the throat has been absent, as is almost invariably the case with Sussex-killed birds. I have only known three specimens with any red on the throat to have been killed in Sussex during the last five years. Will Captain Hadfield excuse my asking the question, Has it been satisfactorily proved that this species, after having obtained the red patch, retains it through the winter? The Captain's note (Zool. 9499) would lead one to suppose that it is so; but Yarrell appears to have been undecided on this point, as he quotes evidence on both sides of the question.

Although we have had several pretty sharp attacks of frost this winter we have had no great quantity of Anatidæ on the coast, and what few have visited us have been of the commoner species, wild duck, widgeon, teal and a few pochards. I have heard of three wild swans having been seen at two places, probably the same three.

MARCH, 1865.

Redwing.—I have frequently, during the month, heard this bird twittering; one day in particular (the 13th of March), about noon, I met with a congregation of them in some trees in a low meadow; there was scarcely any wind, and the sun was shining brightly; it was, in fact, a spring-like morning, and the redwings appeared to be quite aware of it. As I was quietly walking closer to get a better view of them one or two of the birds nearest me gave the alarm-note, a kind of "chook," and in an instant the concert was stopped. After waiting a few moments some of the more distant birds began again, and soon they were all on twittering as before; the least movement on my part, however, caused the signal "chook" to be given, and again all was stopped, or nearly so. Occasionally a bird near me flew to a tree further off, uttering a note on starting somewhat resembling "ceete." In Bechstein's 'Handbook of Cage-Birds,' by Mr. H. G. Adams, this twittering is called "recording." The author says, at page 151, "In favourable weather it may sometimes, during its sojourn in this country, be heard 'recording,' as the bird-dealers term it; that is, running over its modulations, in a low, subdued tone, like one that is striving to recover the notes of some half-forgotten tune, or practising a yet imperfectly-learned musical lesson. The ordinary note of the bird is, however, harsh and shrill. Sometimes a number assembled together at the top of a tree utter this in a low tone in concert, and then it falls on the ear with pleasing effect." These few lines would appear to agree with the ideas expressed by Mr. Harting (Zool. 9106).

Gray Wagtail.—A bird of this species, shot on the 22nd of March, had the black patch on the throat nearly perfect; the white line bounding the black was not, however, very distinct. The change of plumage in this bird is very rapid. The bird above mentioned had frequented the place where it was shot for some time, and on the 13th, being nine days before it was shot, no black was visible. The change appears to be a moult, not merely a change of colour, and is not confined to the throat, new feathers appearing on the forehead of a clearer gray than the old ones, and on the breast new feathers of a clearer and deeper yellow than the old ones. I have not seen a bird of the sort about since, but heard of one having been seen on the 31st of March. In the specimen obtained the testes were very large, about the size of No. 1 shot.

Lesser Redpole.—I shot two of these birds on the 14th of March; they were feeding on the seed of the alder; both were females, and neither uttered any note: after one was shot the other merely flew to the next alder, a few yards off, to await its doom. None seen since.

Green Woodpecker.—A female of this species was brought me on the 28th of March: it was trapped by a gamekeeper, and I have no doubt at a wood-ant hill, as the stomach contained several of these insects. The largest ova were about the size of No. 9 shot: I had anticipated finding them larger, as I have always understood this bird to be an early breeder.

Golden Plover.—Last seen on the 25th of March, when a flock of about thirty, on being disturbed, rose high in the air and disappeared in a N.E. direction. Some of the golden plovers that I have examined lately have had black feathers intermixed with the white ones on the breast.

Gray Plover.—On the 22nd of March I saw five gray plovers, which had recently been killed on the coast. None of these had any of the black feathers on the breast peculiar to the summer plumage.

Redshank.—A few redshanks are to be met with on the coast, and curlews winter with us. No whimbrels, godwits, or any of the waders which arrive in the spring, either to breed in this county or to go further north, have yet made their appearance here.

Spotted Crake.—A specimen of the spotted crake was shot on the 28th of March, at Appledram Common, near Chichester.

Water Rail.—The water rail was seen as late as the 29th of March. I have not ascertained that it breeds in Sussex.

Grebes.—I have lately seen a specimen of the rednecked and one of the Sclavonian grebe, which were shot at Pagham Harbour in February.

The wheatear, willow warbler and chiffchaff, which usually appear in March, have failed to do so this season, probably owing to the wintry weather that we have experienced during the middle and latter part of the month, and from the same cause we have had flocks of redwings quite late in the month, as tame as they have been at any time through the winter. Small flocks of fieldfares seen occasionally up to the 31st of March.

W. Jeffery, Jun.

Ratham, Chichester, April 7, 1865.

Ornithological Notes from the Isle of Wight.

By Henry Rogers.

Fieldfares.—These birds have been unusually abundant. You may find them in every meadow, ploughed field, or on the open down. They visit us every winter, but some years very sparingly: since 1855 I have not seen them in such numbers as during the present season.

Redwing.—This bird visits us every year in great numbers; but this year they far exceed their usual number.

Dartford Warbler.—I fear we shall shortly lose this interesting bird: the Government works are destroying its usual haunts, and the bird is fast disappearing; I have not seen more than three this winter.

Rock Pipit.—A beautiful variety of this bird was shot by Mr. T. Murrow, of the Royal Albion Hotel. The beak, legs and toes pale flesh-colour; the head, wings and tail white; the back and breast mottled: in fact, it was one of the most beautiful varieties I have ever seen. It was given me to preserve for Mr. Bond; unfortunately it was destroyed by a hooded crow which I brought from Egypt last year, he having entered my workroom during my absence; on my return he had torn the pipit all to pieces, except the head and legs, which I kept and have shown to Mr. Bond.

Starling.—Two varieties of this bird have been shot: one a beautiful cream-colour, with bright yellowish margins to the feathers; the other a light gray.

House Sparrow.—A fine variety of this bird; the head pure white, the other parts of the usual colour.

Turnstone.—One fine immature specimen in Alum Bay. This bird is very scarce with us.

Bittern.—I have a fine male and female bittern shot on the River Yar. There were three of them together, which is unusual, two being the most I have ever known to have been seen together, though I obtained five specimens shot by the same river in 1855. I consider this the best shooting ground we have in Freshwater for wading birds and wild fowl.

Little Stint.—I have obtained two specimens of this bird, which is new to our list.

Temminck's Stint.—I have also obtained two of this species, which is another addition to our Isle of Wight list.

Purple Sandpiper.—I obtained one specimen of this bird near the Needles. It is here scarce with us.

Tufted Duck.—I obtained one specimen on the River Yar. It occurs every year, but not in any great numbers.

Redbreasted Merganser.—I shot one in Freshwater Bay. This bird occurs every year.

Common Shieldrake.—Several are shot every year. I obtained a fine male off Yarmouth.

Guillemot.—This bird has been very numerous. Several I obtained were in full summer plumage, which I consider very unusual, never having obtained one before at this time of the year in the same state.

Little Auk.—I have a fine specimen shot in Totland Bay. This bird is very rare with us.

Shag.—A fine immature specimen shot off the Needles. Twenty years ago this bird was common with us, but, like the chough, I fear it will soon be numbered with one of the things of the past. We seldom have a pair breed with us, although the cormorant breeds with us in immense numbers.

Redthroated Diver.—These birds have been very numerous. One day when shooting off the Needles, they flew by in hundreds. I know one man here who shot fifteen on one day.

HENRY ROGERS.

Freshwater, Isle of Wight.

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